

NEW YORK PATHOLOGICAL SOCIETY

ABSTRACTS OF PAPERS

Presented at the meeting of October 22, 1964, at The New York Academy of Medicine

Endocrine Pathology of Prostatic Hypertrophy and Carcinoma

SHELDON C. SOMMERS

Associate Professor of Pathology
Columbia University College of Physicians and Surgeons
New York, N. Y.

A review and synthesis of some endocrine aspects of the pathogenesis of benign prostatic hypertrophy and prostatic carcinoma have been attempted. At birth, the epithelium covering the urethral surface of the prostatic utricle normally is estrogenized and closely resembles the mature woman's cervix. Adult men have a similar utricular estrogenization accompanying untreated prostatic hypertrophy when unobscured by urethritis and in cases of prostatic carcinoma that have been treated with stilbestrol.

In benign hypertrophy about one quarter of the prostates examined by giant sections have shown leiomyomas situated close to the urethra. Thus the so-called uterus masculinus had both epithelial and muscular evidence of estrogen stimulation. Other parts of the prostate demonstrated the usual nodular hypertrophy.

Testicular changes in men with prostatic hypertrophy have involved an apparent atrophy of the Leydig cells and a hypertrophy of spermatogonia in the tubules. With prostatic cancer advanced testicular atrophy commonly had affected both the tubules and

Leydig cells. The hypertrophied spermatogonia were the same as reported in infertile bulls, in animals and men after estrogen therapy, in men treated with chorionic gonadotropin, in the descended testis when one was undescended, and in some other endocrine conditions. In general the testicular tubular changes were thought to reflect gonadotropic stimulation subsequent to a decreased androgen production by Leydig cells. Uninhibited estrogen and possibly adrenocortical steroids were thought responsible for the spermatogonial hypertrophy.

Pituitary cell counts in men with prostatic hypertrophy showed a relative increase of gonadotropic basophils, supporting the idea of an increased gonadotropin and estrogen secretion. In prostatic carcinoma the most frequent type of pituitary alteration that occurred involved increased hypertrophic amphophil cells. This change is common to most types of human invasive internal cancer, but it was not present in several cases of early microscopic prostatic carcinoma.

In Vitro Radioautographic Studies of the Testis in Relation to Prostatic Hypertrophy and Prostatic Cancer: Preliminary Report

BRUNO FINGERHUT AND RALPH J. VEENEMA

Department of Urology
Columbia University Institute of Cancer Research
Francis Delafield Hospital, Squier Urological Clinic
New York, N. Y.

In the course of evaluating by *in vitro* radioautography, the DNA and RNA synthesis in the testes in various clinical conditions, we were impressed by the great number of thymidine H₃-labeled cells per tubular cross section in patients with prostatic cancer. Many of these patients were over 80 years of age.

Tritiated thymidine, precursor of DNA, is used in the *in vitro* radioautography since all incorporation of thymidine represents premitotic DNA synthesis. Sampling biopsies or surgical specimens were placed in a sterile 2 cc. solution of Puck's tissue culture medium containing 20 μ c. per cubic centimeter of tritiated thymidine. This solution, containing the tissue specimen, is then incubated and oxygenated at 37° C. for 24 hours. It is then fixed in Bouin's solution for 12 hours; washed with distilled water; dehydrated by successive passing through butyl alcohol in concentrations 60 per cent to 95 per cent. Routine paraffin histological mounting of 4- to 5- μ sections is then done on slides. Sections are overstained with hemotoxylin and eosin to

compensate for the expected fading during subsequent developing. To prepare the radioautogram slides are dipped into Kodak NTB2 film emulsion; refrigerated at 4° C., and exposed for seven days. After the seven days the slides are removed in the dark room and bathed in freshly prepared developing solution (Dektol D72) and fixed in Kodafix solution. Slides are then washed, dehydrated, placed in medium of cedarwood oil and absolute alcohol, processed through xylol and Canada balsam, and cover-slipped. Using this *in vitro* technique we have obtained consistently good radioautograms.

Based on the presence of thymidine H₃-labeled cells per tubular cross section of testes, we found the highest values in the testes from prostatic cancer cases and, in decreasing order, testes from benign prostatic hypertrophy, and testes from normal prostates (see Table). Although this investigation is in a very preliminary stage, the findings are sufficiently interesting to indicate the need for further pursuit of the study.

IN VITRO RADIOAUTOGRAM STUDIES OF TESTES IN NORMAL INDIVIDUALS AND IN PROSTATIC CANCER AND BENIGN PROSTATIC HYPERPLASIA

Diagnosis	Age group	No. of cases	DNA-labeled cells	No. of granules
			Per cent	Plus or minus
Normal individuals	17	1	8-10	100
	24	1	15-18	50
	31	1	25	100
Prostatic carcinoma	50-60	7	15-50	100
	60-70	16	10-35	100
	70-80	9	11-35	100
	80-90	5	12-50	50
	93	1	11	30
Benign prostatic hyperplasia	45	1	8-10	10
	50-60	2	18-20	100
	72	1	8-10	100
	82	1	18-20	100